



Proceedings of IRC Meeting



(January 06, 2020 and January 17, 2020)

ICAR-Indian Institute of Soil Science

Nabibagh, Berasia Road, Bhopal – 462 038 (M. P.)

GUIDANCE AND DIRECTIONS

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HoD, Soil Biology and Member Secretary, IRC

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INTRODUCTORY REMARKS OF THE CHAIRMAN, IRC

The IRC meeting was held on January 06, 2020 and January 17, 2020 in the committee room of the institute. The member Secretary IRC welcomed the Chairman and other members of IRC and briefed about the purpose and agenda of the meeting. I/c PME Cell presented an account of the contractual project and other activities. The Director and Chairman of the IRC also welcomed all the members of IRC present over there. He took this opportunity to congratulate the award winning scientists for their recognitions and honors. He again stressed that all scientists must submit quality research proposals. The following ongoing and concluded contractual projects were presented. Besides, all other CoPIs of projects have also presented their project activities carried out during 2018-19.

Proceedings of IRC meeting held on 6th Jan 2020 for contractual projects/other activities

Date: January 6, 2020 and January 17, 2020 (10:30 AM; Venue: Committee Room)

Contractual Projects

S.No.	Project Title	PI/Co-PI	Division/Unit	Duration	Budget (in lakhs)	RPP Status	Remarks
1.	Evaluation of efficacy of sulphur and zinc containing complex fertilizers for maximizing yield through balanced nutrition of different crops in India (Zuari Agro Chemicals Ltd)	A.K. Shukla, A.K. Biswas, Sanjay Srivastava, S.K. Behera, B.P. Meena	MSPE	April 2015 to September 2018	147.18	Final report submitted	Presented and concluded
2.	Evaluation of efficacy of zinc metalosate and boron metalosate foliar supplements for maximizing yield through balanced nutrition of important crops grown in India (Indofil Ind. Limited)	A.K. Shukla, A.K. Biswas, S.K. Behera, B.P. Meena	MSPE	June 2015 to September 2018	170.69	Final report submitted	Presented and concluded
3.	Response of crop to applied Potassium in Vertisols of India. (Sponsored project by PRII, Gurgoan)	Muneshwar Singh, R.H. Wanjari, B.L. Lakaria, A.O. Shirale	LTFE	June 2016 to May 2018	49.50	Final report submitted	Presented and concluded
4.	The "Aquasorb" project Effect of aquasorb on water and nutrient use efficiency & crop productivity of soybean & tomato in selected soils of India (Funded by SNF India Pvt. Ltd. Vishakhapatnam)	R.S. Chaudhary, R.K. Singh, K.M. Hati, B.P. Meena, A.K. Biswas, M. Mohanty, A.K. Patra and Sonalika Sahoo	Soil Physics	July 2016 to June 2018	22.56	Final report submitted	Presented and concluded
5.	Effect of slow N release formulations for enhancing productivity and nitrogen use efficiency in cereals sponsored by Rhodia Specialty Chemicals India limited, Mumbai	B.L. Lakaria, Pramod Jha, Sanjay Srivastava, A.K. Vishwakarma, A.K. Biswas and A.K. Patra	SC&F	June 2017 to June 2018	12.52	Final report submitted	Presented and concluded
6.	Evaluation of Soil Test Kit of Warkem, Mumbai	Sanjay Srivastava, Pramod Jha, A.O. Shirale, M. Vassanda Coumar, Gurav Priya	SC&F	September 2017 to February 2018	5.35	Final report submitted	Presented and concluded

		Pandurang, A.K. Biswas, Pradip Dey and A.K. Patra					
7.	Impact of viscose staple fibre industry treated effluent on soil health and crop production surroundings Nagda, M.P funded by M/s Grasim Industries Limited, Nagda, Ujjain, M.P.	Tapan Adhikari, J.K. Saha, M. Vassanda Coumar, R.H. Wanjari, N.K. Sinha and A.K. Patra	ESS	November 2017 to October 2020	67.55	Final report not submitted	Presented and continued
8.	Evaluation of effect of Zeba fertilizer product on nitrate-N leaching funded by M/s UPL Limited, UPL House, 610B12, Bandra Village, Off Western Express Highway, Bandra-East, Mumbai- 400 051	A.K. Biswas, R. Elanchezhian, N.K. Lenka, A.O. Shirale, A.K. Patra	SC&F	December 2018 to October 2019	19.26	Half report submitted	Presented and continued

Project and other activities

	Name	Division	Remarks
9.	Dr. A.K. Tripathi	SBD	Presented activities carried out in 2018-19. Field data/survey data to be included, new project to be initiated
10.	Dr. Kollah Bharati	SBD	Presented activities carried out in 2018-19. New project to be initiated
11.	Dr. J.K. Thakur	SBD	Presented activities carried out in 2018-19. New project to be initiated
12.	Dr. Asha Sahu	SBD	New project (pre-RPP-1) presented and approved for RPP-1
13.	Dr. Hiranmoy Das	AICRP (STCR)	Presented activities carried out in 2018-19. New project to be initiated
14.	Dr. Vasudev Meena	ESS	Presented activities carried out in 2018-19. New project to be initiated
15.	Dr. Dolamani Amat	SBD	Presented activities carried out in 2018-19. New project to be initiated
16.	Mrs. Seema Bhardwaj	SPD	New project to be initiated, presented activities up to April 2018 to March 2019
17.	Dr. Alka Rani	SPD	Presented activities carried out in 2018-19. New project to be initiated

Concluding Remarks of the Chairman

The Director in the end congratulated all the speakers for best presentations and praised about the outcome of the contractual projects. He emphasized on proper evaluation of the final reports of the contractual projects for optimal utilization of the institute-industry linkages. He also highlighted the importance of timely submission of CRs/RPPs for proper project monitoring. He has stressed upon the final output and subsequent line of work to be carried out from the concluded projects. He has urged all scientists to route all publications through PME Cell for proper compilation and record. He has requested all the PIs of contract research project to include cost of water resources. He informed all the PIs to formulate product oriented new projects. Also, augmented for validation of probable technologies in the farmers' fields. He urged everyone to improve the visibility of the institute. He has suggested to revise the MoU guidelines with SAUs/ Universities/ Institutes and requested scientists of the institute to act as Major guide/ chairman. Besides, he has informed Academic cell to conduct thesis seminar of students before submission.

Division wise/Co-coordinating Unit-wise Number of Projects

Sl. No.	AICRP/ Division	Sl. No. of Project	Total
1.	AICRP on LTFE	3	1
2.	AICRP on STCR	-	-
3.	AICRP on MSPE	1,2	2
4.	AINP on SBB	-	-
5.	Soil Chemistry and Fertility	5,6,8	3
6.	Soil Physics	4	1
7.	Soil Biology	-	-
8.	Environnemental Soil Science	7	1

Project (serial numbers) with individual scientist

S. No.	Name of Scientist	Designation	Sl. of projects		Total
			PI	Co-PI	
1	Dr. A.K. Patra	Director	-	4,5,6,7,8	5
AICRP on LTFE					
1	Dr. Muneshwar Singh	Project Co-coordinator	3	-	1
2	Dr. R. H. Wanjari	Senior Scientist	-	3,7	2
AICRP on STCR					
1	Dr. Pradip Dey	Project Co-ordinator	-	6	1
2	Dr. Hiranmoy Das	Scientist	-	-	-
AICRP on MSPE					
1	Dr. A.K. Shukla	Project Co-ordinator	1,2	-	2
2.	Dr. S.K. Behera	Sr. Scientist	-	1,2	2
AINP on BF					
1	Dr. S.R. Mohanty	I/c Project Co-ordinator	-	-	-
Soil Chemistry and Fertility					
1	Dr. A. K. Biswas	Head of Division & Pr. Scientist	8	1,2,4,5,6	6
2	Dr. Sanjay Srivastava	Principal Scientist	6	1,5	3
3	Dr. Brij Lal Lakaria	Principal Scientist	5	3	2
4	Dr. R. Elanchezhian	Principal Scientist	-	8	1
5	Dr. N.K. Lenka	Principal Scientist	-	8	1
6	Dr. A.K. Vishwakarma	Principal Scientist	-	5	1
7	Dr. Pramod Jha	Principal Scientist	-	4,5	2
8	Dr. B.P. Meena	Scientist	-	1,2,4	3
9	Dr. Shinogi K.C.	Scientist	-	-	-
10	Dr. Abhay Shirale	Scientist	-	3,6,8	3
11	Dr. Gurav Priya Pandurang	Scientist	-	6	1
12	Dr. Narayan Lal	Scientist	-	-	-
Soil Physics Division					
1	Dr. R.S. Chaudhary	Principal Scientist & I/c Head of Division	4	-	1
2	Dr. Kuntal M. Hati	Principal Scientist	-	4	1
3	Dr. R.K. Singh	Principal Scientist	-	4	1
4	Dr. J. Somasundaram	Principal Scientist	-	-	-
5	Dr. Prabhat Tripathi	Principal Scientist	-	-	-
6	Dr. M. Mohanty	Principal Scientist	-	4	1
7	Dr. N.K. Sinha	Scientist	-	7	1
8	Mrs. Seema Bhardwaj	Scientist	-	-	-
9	Dr. Jitendra Kumar	Scientist	-	-	-
Soil Biology					
1	Dr. M.C. Manna	Principal Scientist & Head of Division	-	-	-

2	Dr. A.B. Singh	Principal Scientist	-	-	-
3	Dr. A.K. Tripathi	Principal Scientist	-	-	-
4	Dr. S.R. Mohanty	Principal Scientist	-	-	-
5	Dr. K. Bharati	Principal Scientist	-	-	-
6	Dr. Asit Mandal	Scientist	-	-	-
7	Dr. Asha Sahu	Scientist	-	-	-
8	Dr. J.K. Thakur	Scientist	-	-	-
9	Dr. S. Bhattacharjya	Scientist	-	-	-
10	Dr. Dolamani Amat	Scientist	-	-	-
Environmental Soil Science					
1.	Dr. J.K. Saha	Principal Scientist & I/c Head of Division	-	7	1
2.	Dr. Ajay	Principal Scientist	-	-	-
3.	Dr. Tapan Adhikari	Principal Scientist	7	-	1
4.	Dr. S. Ramana	Principal Scientist	-	-	-
5.	Dr. M. Vassanda Coumar	Scientist	-	6,7	2
6.	Dr.(Mrs.) Sangeeta Lenka	Scientist Sr. Scale	-	-	-
7.	Mr. Vasudev Meena	Scientist	-	-	-
8.	Dr. Abhijit Sarkar	Scientist	-	-	-
9.	Dr. Madhumonti Saha	Scientist	-	-	-
10.	Dr. Nisha Sahu	Scientist	-	-	-
Scientists from other Institutes					
1	Dr. Sonalika Sahoo	Scientist, ICAR-NBSS&LIP RC, Nagpur	-	4	1

LIST OF PARTICIPANTS

S. No.	Name of Scientist	Designation
1.	Dr. A. K. Patra	Director & Chairman, IRC
2.	Dr. Muneshwar Singh	Project Co-ordinator, LTFE
3.	Dr. A.K. Shukla	Project Co-ordinator, MSN
4.	Dr. Pradip Dey	Project Co-ordinator, STCR
5.	Dr. R.S. Chaudhary	Principal Scientist & I/c Head of Division
6.	Dr. A.K. Biswas	Principal Scientist & I/c Head of Division
7.	Dr. M.C. Manna	Principal Scientist & Head of Division and Member Secretary, IRC
8.	Dr. J.K. Saha	Principal Scientist & I/c Head of Division
9.	Dr. A.B. Singh	Principal Scientist
10.	Dr. Ajay	Principal Scientist
11.	Dr. A.K. Tripathi	Principal Scientist
12.	Dr. Sanjay Srivastava	Principal Scientist
13.	Dr. Brij Lal Lakaria	Principal Scientist
14.	Dr. Kuntal M. Hati	Principal Scientist
15.	Dr. R. Elanchezhian	Principal Scientist
16.	Dr. S. Ramana	Principal Scientist
17.	Dr. N.K. Lenka	Principal Scientist
18.	Dr. R.K. Singh	Principal Scientist
19.	Dr. R.H. Wanjari	Principal Scientist
20.	Dr. A.K. Vishwakarma	Principal Scientist
21.	Dr. J. Somasundaram	Principal Scientist
22.	Dr. S.R. Mohanty	Principal Scientist
23.	Dr. Pramod Jha	Principal Scientist
24.	Dr. K. Bharati	Principal Scientist
25.	Dr. M. Mohanty	Principal Scientist
26.	Dr. SK Behera	Senior Scientist
27.	Dr. M.V. Coumar	Scientist
28.	Dr. Hiranmoy Das	Scientist
29.	Dr. Sangeeta Lenka	Scientist
30.	Dr. N.K. Sinha	Scientist
31.	Dr. Asit Mandal	Scientist
32.	Dr. Asha Sahu	Scientist
33.	Dr. JK Thakur	Scientist
34.	Dr. Shinogi K C	Scientist
35.	Dr. Bharat Prakash Meena	Scientist
36.	Dr. AO Shirale	Scientist
37.	Dr. Sudeshna Bhattacharjya	Scientist
38.	Dr. Dolamani Amat	Scientist
39.	Dr. Seema Bhardwaj	Scientist
40.	Dr. Vasudev Meena	Scientist
41.	Dr. Madhumanti Saha	Scientist
42.	Miss Alka Rani	Scientist
43.	Dr. Nisha Sahu	Scientist
44.	Dr. Narayan Lal	Scientist
45.	Dr. Jitendra Kumar	Scientist

Research Achievements

Sl. No.	Title of Project
1	Evaluation of efficacy of sulphur and zinc containing complex fertilizers for maximizing yield through balanced nutrition of different crops in India (Zuari Agro Chemicals Ltd)
	The seed yield of soybean (Cv. JS-9560) varied from 0.75 to 1.55 t ha ⁻¹ and 0.81 to 1.47 t ha ⁻¹ under different treatments at two different locations of experimentation. Whereas, wheat grain yield varied from 3.11 to 4.96 t ha ⁻¹ for Cv. HD-2987 and 3.62 to 5.96 t ha ⁻¹ for Cv. Lok-1 under different treatments. Application of sulphur and zinc either in the form of direct fertilizers or through NPS-1, NPS-2 and NPSZn produced higher seed/grain yield in soybean crops at both the locations. Higher crop responses under NPKSZn treatments over NPK treatment were recorded for both the crops. Total S uptake by soybean varied from 4.90 to 9.60 kg ha ⁻¹ and 3.1 to 6.0 kg ha ⁻¹ under different treatments at two places of experimentation. Whereas, total S uptake by wheat Cv. HD2987 ranged from 11.6 to 22.4 kg ha ⁻¹ and by Cv, Lok 1 ranged from 17.0 to 38.5 kg ha ⁻¹ under different treatments. Total Zn uptake by soybean varied from 55.8 to 119 g ha ⁻¹ and 58.1 to 137 g ha ⁻¹ under different treatments at two places of experimentation. Whereas, total Zn uptake by wheat Cv. HD2987 ranged from 191 to 319 g ha ⁻¹ and by Cv, Lok 1 ranged from 180 to 378 g ha ⁻¹ under different treatments. Application of S and Zn along with NPK enhanced S and Zn uptake by the crops respectively compared to NPK application alone. The uptake of S and Zn by the crops under direct fertilizer application was at par with S and Zn uptake of the crops obtained under application of NPS-1, NPS-2 and NPSZn.
2	Evaluation of efficacy of zinc metalosate and boron metalosate foliar supplements for maximizing yield through balanced nutrition of important crops grown in India (Indofil Ind. Limited)
	The grain yield of maize varied from 5.38 to 6.88 t ha ⁻¹ (Shaktiman 5) and 4.58 to 6.24 t ha ⁻¹ (Nath Samrat 1144) under different Zn treatments at two different locations. Whereas, wheat grain yield varied from 3.59 to 4.58 t ha ⁻¹ (HD 2987) and 5.52 to 6.43 t ha ⁻¹ (Lok 1) under different Zn treatments. Application of Zn either through soil or foliar application (either through Zn SO ₄ or Zn metalosate or Zn-EDTA) enhances grain yield of both the crops. The grain Zn uptake of maize varied from 96.2 to 164 g ha ⁻¹ (Shaktiman 5) and 87.6 to 181 g ha ⁻¹ (Nath Samrat 1144) under different Zn treatments. Whereas, wheat grain Zn uptake varied from 122 to 188 g ha ⁻¹ (HD 2987) and 154 to 239 g ha ⁻¹ (Lok 1). The grain yield of maize varied from 4.82 to 6.57 t ha ⁻¹ (Shaktiman 5) and 4.16 to 5.58 t ha ⁻¹ (Nath Samrat 1144) under different B treatments at two different locations, whereas, wheat grain yield varied from 3.94 to 4.73 t ha ⁻¹ (HD 2987) and 4.64 to 6.42 t ha ⁻¹ (Lok 1). Application of B either through soil or foliar application (either through B metalosate or Boric acid) enhances grain yield of both the crops.
3	Response of crop to applied Potassium in Vertisols of India. (Sponsored project by PRII, Gurgaon)
	<ul style="list-style-type: none"> Field demonstrations were conducted on five locations on Vertisols with test crops were rice, wheat and soybean. The data generated at different locations revealed response of rice to applied K even though having available K more than 280 Kg ha⁻¹ at Bhopal and Jagtial. Response of applied K in soybean was found at Parbhani and not at Jabalpur may be because of poor biomass production due to excess rain fall. Response of K in wheat was recorded when productivity level is high.
4	The "Aquasorb" project Effect of aquasorb on water and nutrient use efficiency & crop productivity of soybean & tomato in selected soils of India (Funded by SNF India Pvt. Ltd. Vishakhapatnam)
	The effect of application of graded doses of PAA hydro gel (@0, 10, 20, 30, 40 and 50 kg ha ⁻¹ to soil) on water absorption and retention at various suction levels (0 -15bar) in three soils of varying textures viz. clay, silty clay loam, and sandy loam, studied revealed that the water retention of these soils was augmented by hydro gel to variable degrees between 0.3 and 1.0 bar of matric suction. The effect seems good only at 0 - 0.3 bar, beyond which the effect is small that too up to 1 bar. The matric suction of 0 to 1.0 bar, however, is a narrow range especially for rain fed crops where the irrigation water is scarce and a farmer re-irrigates the crops even at 10 bar moisture content.
5	Effect of slow N release formulations for enhancing productivity and nitrogen use efficiency in cereals sponsored by Rhodia Specialty Chemicals India limited, Mumbai
	A field experiment was initiated to assess the formulations from M/s Rhodia Specialty Chemical Fertilizer Pvt Ltd. The experiment consisted of 15 treatment combinations involving two N levels, two formulations and a control. Maize (CV 4212) grain yield under different treatments varied between 2717 and 7484 kg ha ⁻¹ . Application of N at lower level i.e. 80 kg ha with test formulations, the maize grain yield ranged between 4636 and 5839 kg ha ⁻¹ . The formulation 0.3% AgRho N protect B resulted in significantly higher yield over 0.2% AgRho N protect B at 80 N ha ⁻¹ . The maize grain yield was increased with 120 kg N ha ⁻¹ for urea, NUC as well as test formulations and was varied between 5578 and 6277 kg ha ⁻¹ . The formulation AgRho NN protect B has shown higher yields over N protect B at both the concentration levels. At 120 kg ha ⁻¹ N application, highest grain yield was recorded with 0.3% AgRho NN protect B which was statistically at par with 0.2% AgRho NN protect B. The agronomic N use efficiency varied between 21.03 and 41.71 per cent which was highest at 80 kg N ha ⁻¹ followed by 120 kg N ha ⁻¹ .
6	Evaluation of Soil Test Kit of Warkem, Mumbai
	The soil test kit developed by Warkem was evaluated. This project aimed at technical evaluation of the kit against standard laboratory procedures. Also, if required suitable improvements in the kit would be suggested. The kit has been evaluated for N, P, K, OC, pH, B, Mn, Fe, Zn, Cu, Mo, and soil texture. The work is completed.
7	Impact of viscose staple fibre industry treated effluent on soil health and crop production surroundings Nagda, M.P funded by M/s Grasim Industries Limited, Nagda, Ujjain, M.P.
	<ul style="list-style-type: none"> Survey and collection of soil water samples: Soil and effluent samples were collected from different sites surroundings Nagda town. Soil samples in particular collected from adjoining effluent irrigated fields as well as

	<p>tube-well irrigated fields. Physico-chemical properties of the effluent and bore-well water were estimated including heavy metals by different standard methods. The results revealed that electrical conductivity in soil (recorded maximum 5.75 dS/m) was the critical problem for crop cultivation. As the E.C in irrigation water was also recorded high (7.28 dS/m), more number of irrigation will convert the land barren after few years. Heavy metal (cadmium, nickel, cobalt, lead, chromium etc.) content was not so high in water samples. The colour of bore well and river water was red.</p> <ul style="list-style-type: none"> • Green House Experiment: Bulk soil samples from different sites were collected for green house study. Pot culture study was conducted to identify suitable crops along with management practices using the treated effluent. • Field Experiments: Parallel to laboratory experiments, field experiments with different doses of FYM (0, 5, 10, 20 t/ha) were conducted at Atlawda, Nenawatkhedha, Banbana, BCI Farm and Bheelsuda. Soybean (<i>Glycine max</i>) was taken as a test crop. In case of BCI Farm, due to bird and cattle menace crop was not grown. Green manuring through Dhaincha and Sunhemp was practiced in BCI Farm. It was found that the highest yield was recorded in Banbana Farm (Normal Soil). Due to salinity effect poor yield was recorded at Atlawda and particularly in Nenawatkhedha village and soybean seeds were shrunken and small in size whereas soybean seed in normal soil was bold in size.
8	<p>Evaluation of effect of Zeba fertilizer product on nitrate-N leaching funded by M/s UPL Limited, UPL House, 610B12, Bandra Village, Off Western Express Highway, Bandra-East, Mumbai- 400 051</p>
	<p>An incubation column experiment with Zeba coated fertilizer on N leaching was carried out in black soil. Two different application methods viz, surface application and incorporation was studied with simulated rainfall and saturated condition. The arrangement of N leached from the soil was being analyzed in the Zeba fertilizer in caparison with normal neem coated urea.</p>
